# Why we stereotype influences how we stereotype. Self-enhancement and comprehension effects on social perception

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# Chapter 4

## Comprehension and stereotyping: goal or mode[6]

*"Eureka, eureka!" (Archimedes, circa 260 BC)*

Archimedes euphorically jumped out of his bathtub and ran around the streets of Syracuse while shouting his now famous words because he *understood* something: the relation between buoyancy and density. Archimedes' ecstatic behavior after stumbling upon an answer to an important problem illustrates the importance people attribute to comprehension.

Fittingly, in social psychological research, "comprehension" is often coined as one of the core motives underlying stereotyping (Macrae & Bodenhausen, 2000; Fiske, 2002; Kunda & Spencer, 2003). Stereotypes are cognitive structures that contain knowledge, beliefs, and expectations about social categories (Kunda, 1999). Without the use of stereotypes it would be impossible to make sense of the daily bombardment of social stimuli due to cognitive capacity constraints. In addition, on a more social level, stereotypes can assist in the construction of meaningful person impressions and in the disambiguation of social information ("Why is Lisa behaving so eccentric? Ah, she is an artist, that's why!"). Congruently, people with a heightened need for structure (Neuberg & Newsom, 1993) and situations in which one discovers a puzzling disagreement with someone (Miller & Prentice, 1999) have been found to result in increased stereotyping (for a review, see Kunda & Spencer, 2003). Furthermore, Stapel and Koomen (2001) showed that exposure to comprehension-related words led to increased stereotypical interpretations of ambiguous behavior. Thus, when comprehension is especially salient (e.g., through priming techniques), stereotyping and other categorization effects are more likely to result than when comprehension is not on top of people's minds[7] (see e.g. Stapel & Koomen, 2001; Van den Bos & Stapel, 2006).

Interestingly, the current literature is rather vague about what exactly is activated when comprehension is primed and in what way this influences stereotyping behavior. What are the dynamics of comprehension-driven stereotyping effects? Are there different types of comprehension and different routes to comprehension effects? Does priming of the

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[6] This chapter is based on Van den Bos & Stapel (2007c).

[7] There are situations in which this comprehension-stereotyping link does not apply. For example, when stereotyping is unnecessary (e.g. when there is enough diagnostic info; Yzerbyt, Leyens, Schadron, & Rocher, 1994) or unwanted (e.g. when the perceiver highly values egalitarianism; Moskowitz, Gollwitzer, & Wasel, 1999) for constructing a meaningful view of another person, it will not be used when in need for comprehension. In the present set of studies, we focus on the use of stereotypical knowledge when interpreting ambiguous behavior.

construct of comprehension always lead to increased stereotyping? As far as we know, these questions have not been investigated in a systematic, empirical manner. In the present research we will fill this void by focusing on the ways comprehension can be on people's mind (i.e. mentally represented) and how this influences stereotyping behavior. More specifically, we will show that comprehension can be mentally represented in at least two ways: as a *goal* (motivational) and as a *processing mode* (non-motivational). We will argue and demonstrate that how comprehension is mentally represented is an important determinant of the type of stereotyping effects that occur.

**Goal-driven stereotyping**

A goal-related view of the connection between a concept (such as comprehension) and a related action (such as stereotyping) is that goals are cognitively represented in a similar way as other constructs (such as traits, exemplars, stereotypes, prototypes) and that they therefore can be activated without deliberate choice. Thus, exposure to goal-related stimuli or situations may automatically elicit goal pursuit. To give an example, a job interview or an exam situation may automatically activate the goal to comprehend because of the importance of this goal in these situations (see Chartrand & Bargh, 2002).

When one adopts a goal-based approach for the link between motivation and behavior, it has been argued that for a certain behavior that represents a means to a goal to be carried out, this goal has to be activated; without the motivation, thoughts related to the facilitation of motives (i.e. means to a goal) would not be activated or would not lead to action (Strahan, Spencer, & Zanna, 2002). Thus, when one views stereotyping as a means to achieve a comprehension goal, comprehension-based stereotyping will occur mainly when this goal is cognitively activated. A strict goal-based approach to stereotyping thus suggests that when people do not have a comprehension *goal*, comprehension-based stereotyping is unlikely to occur. No goal, no stereotyping (see Kunda & Spencer, 2003).

**Mode-driven stereotyping**

Given that the past decades of priming and knowledge accessibility research have shown that behaviors may be primed by a diverse array of constructs (e.g., traits, exemplars, self-images, relations, norms), to us a strict goal-based approach to explaining stereotyping seems to be overly restrictive. When one adopts a more lenient perspective on the possible

routes through which cognitive activation leads to behavior, comprehension-based stereotyping that is *not* goal-driven may also be possible. As Bargh (1997) has forcefully argued in his seminal paper on the automaticity of everyday life, a certain behavior may become more likely to be executed, simply because of the priming of constructs that are (in some way) related to this behavior. Thus, people act more impertinently when primed with "skinheads," they walk slower when primed with "the elderly," and they write more legibly when primed with "secretaries" (see Spears, Gordijn, Dijksterhuis, & Stapel, 2004). This is, Bargh (1997) argues, because these non-behavioral constructs (elderly) and behaviors (walking speed) are all connected in an associative, cognitive network.

This view of cross-modular connectedness (also see Treisman, 1996) does not assess the functional relation between constructs (e.g., "comprehension") and behaviors (e.g., "stereotyping") as relevant for the activation of behavior: Priming of the relevant construct is sufficient for associated behaviors to be activated. When it concerns the question whether nonmotivational comprehension priming may increase stereotyping effects, the cross-modular connectedness view is relatively lenient. Not solely the activation of comprehension goals, but rather the activation of any type of comprehension-associated construct could lead to stereotyping. Thus, the cross-modular view suggests that as long as the construct of comprehension is activated, people are in a comprehension *mode*[8], look at the world through "comprehension-colored" glasses, and are thus more likely to engage in behaviors associated with the construct of comprehension, including stereotyping.

**Modes versus goals**

In sum then, given the cross-modular connectedness of constructs that are relevant to comprehension-based stereotyping, it seems logical to assume that priming a comprehension goal as well as priming a comprehension mode may lead to stereotyping. However, this does not mean that these two types of priming should lead to identical effects. On the contrary, recent investigations of the differences between motivational and nonmotivational priming effects may be interpreted as suggesting that these two pathways from comprehension to stereotyping behavior may lead to different stereotyping effects.

[8] Various concepts have been used to denote certain nonmotivational (behavioral) priming effects (e.g., norm, procedure, knowledge base, mindset). To represent a mental state that can incorporate all behavioral effects associated with a heightened accessibility of the concept of comprehension, we have chosen the broader term "comprehension mode."

Specifically, cognitive and social psychological research has shown that goal priming effects have different characteristics than nonmotivational priming effects (e.g. procedural, semantic, mindset). On the one hand, the strength of goal-priming effects remains relatively stable or even increases until a goal is fulfilled or attained. After fulfillment, these effects decrease dramatically. On the other hand, nonmotivational priming effects decay steadily over time and are not influenced by fulfillment of related goals (Atkinson & Birch, 1970; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001, Förster, Liberman, & Higgins, 2005; Zeigarnik, 1927).

In the present investigation we adopt this knowledge about the differences between motivational (goal) and nonmotivational (mode) priming to test the hypothesis that comprehension goal versus comprehension mode priming will differentially affect stereotyping. Thus, we are the first to compare and contrast these different types of comprehension priming. Furthermore, and perhaps more importantly, we do this in a stereotyping context. Thus, the present research may tell us something about the possible bases of stereotyping, which in turn may point to effective stereotype change programs. If stereotyping is goal-based, this means its influence can be curbed by fulfilling the goal or otherwise disengaging from the goal. If stereotyping is mode-based however, goal-fulfillment should be of no influence on stereotyping.

In five studies we will examine the impact of comprehension goals and comprehension modes on stereotyping behavior. In Study 1, we test whether a comprehension goal versus a comprehension mode can be manipulated successfully in an experimental set-up. In the following studies, stereotyping is measured by focusing on the use of applicable stereotypical knowledge when interpreting ambiguous behavior. In Study 2, the impact of a period of delay on the comprehension-stereotyping link will be examined. In Study 3, we will examine the impact of different forms of comprehension acquirement on stereotyping. In Study 4, we will examine the relation between the construct of comprehension and accuracy with respect to stereotyping effects. Finally, in Study 5 we aim to replicate our main results in a subliminal priming paradigm.

## Study 4.1: Manipulating comprehension

When studying the effects of comprehension-driven stereotyping in an experimental set-up, it is imperative to make sure that one can successfully manipulate – and distinguish between - a comprehension mode and a comprehension goal. Therefore, the aim of the

current study was to construct two versions of a sentence unscrambling task in order to effectively activate a comprehension goal as well as a comprehension mode. For this task we measured the motivational impact of two versions of a priming procedure that has been previously used to induce a comprehension goal: exposure to comprehension-related constructs (e.g., Srull & Wyer, 1979; Stapel & Koomen, 2001). Although this construct priming procedure has been linked to the actual activation of comprehension goals and results have been interpreted in terms of the activation of this goal (see e.g., Bargh, 1997; Chartrand & Bargh, 2002; Gollwitzer & Moskowitz, 1996; Stapel & Koomen, 2001), we know of no empirical studies that *empirically* and *directly* tested whether participants actually exhibited an increased motivation to comprehend.

Goals are described as desired states that one aims to attain (Aarts & Dijksterhuis, 2000; Carver & Scheier, 1981; Gollwitzer & Moskowitz, 1996; Locke & Latham, 1990). Consequently, mental goal representations not only specify the state that is desired ("attain comprehension"), but also contain information that such a state is desirable ("comprehension is good"; also see Custers & Aarts, 2005). Therefore, we hypothesized that exposure to comprehension-related constructs, combined with information that comprehension has value for the self and is desirable to attain, will result in the priming of a comprehension *goal,* whereas exposure to only comprehension-related words does not indicate that the primed construct is desirable and therefore results in the priming of a comprehension *mode*.

**Method**

*Participants and Design*

Participants were 30 students who were randomly assigned to one of the three priming conditions (neutral, comprehension goal, comprehension mode).

*Materials and Procedure*

All participants were given a booklet consisting of two tasks. The first task, the sentence unscrambling task (Srull & Wyer, 1979) was used to manipulate a comprehension goal and a comprehension mode. Participants in the comprehension goal condition were exposed to twelve scrambled sentences. Six of these scrambled sentences contained words related to comprehension (understanding, grasping, comprehension, why, interpreting and meaning). These sentences were also self-related (by inclusion of the word "I"), thereby potentially making the objective (comprehension) desirable (something is potentially desirable

when it has value for the self). Also, by including motivational words as "want," a goal to move towards the desirable construct was implied. The participants were asked two things: (1) To unscramble the twelve sentences and (2) To imagine themselves in the situations that the self-related sentences described. For example, when exposed to the scrambled sentence "I – it – understand - want to - chair", participants were asked to write down "I want to understand it" and to imagine themselves in a situation were they want to understand something. Participants in the comprehension mode condition underwent a similar procedure, with the exception that there were no self-related words, no goal was implied and they were only asked to unscramble the sentences. For example: "He – things - interprets – to" would become "He interprets things". In the control condition, participants underwent a sentence unscrambling task similar to the comprehension mode condition, but only with neutral words.

The second task was designed to measure current comprehension needs, self-enhancement goals, and mood. Participants were asked to indicate how much they agreed with five statements on a 9-point scale (1 = *not at all,* and 9 = *completely*). The first statement represented the single-item self-esteem scale ("I have a high self-esteem", Robins, Hendin, & Trzesniewski, 2001). The second and the third statement were related to self-enhancement motives ("At this moment I have the need to heighten my self-esteem" and "At this moment I would like to increase my self-worth"). The fourth and fifth statement reflected comprehension needs ("I have the need to explain things that happen around me" and "I am interested in the drives of people", r = .77). After that, participants expressed their current mood ("How negative / positive are your feelings currently?") on a 9-point scale (1 = *very negative*, and 9 = *very positive*). Finally, participants were asked to fill in a debriefing questionnaire.

**Results and discussion**

As expected, there were no effects of our manipulation on self-esteem, self-enhancement goals, and mood (all $Fs < 1$). A one-way analysis of variance (ANOVA) revealed a main effect of priming on comprehension needs, $F(2, 27) = 4.45$, $p < .05$, $\eta^2 = .25$. As expected, participants in the comprehension goal condition indicated they had a higher need for comprehension ($M = 5.57$, $SD = 1.09$) compared to participants in the neutral priming condition ($M = 4.25$, $SD = .92$), $F(1, 27) = 7.87$, $p < .01$, $\eta^2 = .22$ and compared to participants in the comprehension mode condition ($M = 4.50$, $SD = 1.24$), $F(1, 27) = 5.58$, $p$

< .05, $\eta^2$ = .16. To put these numbers in words, we succeeded in the construction of a method to activate a comprehension goal versus a comprehension mode.

## Study 4.2: Prime time

Having established that we are able to successfully activate a comprehension goal and a comprehension mode we may now examine the impact of a period of delay on the comprehension-stereotyping link. More specifically, we test the hypothesis that an activated comprehension mode as well as an activated comprehension goal both result in increased stereotyping, given that the priming procedure and the person perception task immediately follow each other. However, when there is a time delay, we expect mode-based stereotyping to decrease, because of the decaying activation level of the comprehension mode. With respect to goal-based stereotyping, however, we expect no decrease of stereotyping after a delay -as long as the goal is not fulfilled (e.g., Forster et al., 2005).

### Method

*Participants and Design*

Participants were 79 students, who were randomly assigned to one of the six conditions of a 3 (Priming: neutral vs. comprehension goal vs. comprehension mode) x 2 (Delay: no delay vs. delay) between-participants design.

*Materials and Procedure*

All participants were given a booklet consisting of three tasks. The first task was the priming procedure and was identical to the sentence construction task used in Study 1. The second task concerned the delay manipulation. Delay was manipulated by asking participants to perform a neutral task that took circa ten minutes: Participants were asked to read three neutral texts and to encircle all definite and indefinite articles. The third task concerned measuring the level of stereotyping and was presented as a study involving impression formation. Participants were instructed to read a short target paragraph about a person "Peter" and to try to form an impression of this target. The target paragraph described a series of activities involving the target and included behaviors that were ambiguously related to the stereotype of male aggressiveness, self-assuredness, and egoism. After participants had read the paragraph they were asked to indicate on a 9-point scale (1 = *not at all*, and 9 =

*completely)* to what extent they assigned a series of traits to the target's personality (see for details, Banaji, Hardin, & Rothman, 1993; Stapel & Koomen, 1998; Stapel & Koomen, 2001). The traits in question were assertive, aggressive, self-assured, egoistic (male stereotypical traits, combined to one variable; Cronbach's $\alpha$ = .81), analytical, sloppy, optimistic, ungrateful, pessimistic, competent (unrelated traits). Stereotyping was measured by means of the score on the combined stereotyping measures. Finally, participants were given a debriefing questionnaire.

**Results and discussion**

A 3 (Priming) x 2 (Delay) ANOVA revealed no effects on the unrelated traits (all *ps* > .14). An ANOVA on the combined stereotyping variable revealed a main effect of priming, $F(2, 73) = 13.12$, $p < .001$, $\eta^2 = .21$ that was qualified by an interaction effect, $F(2, 73) = 10.98$, $p < .001$, $\eta^2 = .18$. As predicted, this interaction indicated that when there was no delay, participants in the neutral priming condition stereotyped less ($M = 5.37$, $SD = .92$) compared to participants in the comprehension mode condition ($M = 6.65$, $SD = .62$) , $F(1,73) = 17.66$, $p < .001$, $\eta^2 = .24$ and to participants in the comprehension goal condition ($M = 6.30$, $SD = .64$), $F(1, 73) = 9.71$, $p < .01$, $\eta^2 = .13$ (see Table 4.1).

With regard to the effect of delay on comprehension-driven stereotyping, our hypothesis was confirmed as well. Participants in the comprehension mode condition stereotyped *less* after delay ($M = 5.40$, $SD = .81$) compared to participants in the comprehension mode condition who did not experience a delay ($M = 6.65$, $SD = .62$), $F(1, 73) = 17.91$, $p < .001$, $\eta^2 = .25$. Participants in the comprehension goal condition on the other hand, stereotyped *more* after delay ($M = 6.92$, $SD = .77$) compared to participants in the comprehension goal condition who did not experience a delay ($M = 6.30$, $SD = .64$), $F(1, 73) = 4.23$, $p < .05$, $\eta^2 = .06$. In the neutral priming conditions there were no differences ($F < 1$).

These results indicate that both an activated comprehension mode and a comprehension goal may lead to more stereotyping. However, in a comprehension mode, stereotyping effects decrease over time. Conversely, when a comprehension goal is activated, stereotyping effects may increase over time. This latter finding is in line with Atkinson and Birch's (1970) "dynamic theory of action," in which it is posited that until a certain goal is acted on, the action tendency can increase over time, thus pressing for the realization of this goal (see also Bargh et al., 2001).

Table 4.1 - Stereotyping as a function of priming condition and delay

| | *Priming* | | | | | |
|---|---|---|---|---|---|---|
| | *Neutral* | | *Comprehension Goal* | | *Comprehension Mode* | |
| *Delay* | *No delay* | *Delay* | *No delay* | *Delay* | *No delay* | *Delay* |
| Stereotyping | $5.37_{a}$ | $5.54_{a}$ | $6.30_{b}$ | $6.92_{c}$ | $6.65_{b}$ | $5.40_{a}$ |
| | (0.92) | (0.96) | (0.64) | (0.77) | (0.62) | (0.81) |

Note: means in the same row which do not share the same subscript differ significantly ($p < .05$).

## Study 4.3: Fulfilling needs

In the previous two studies, we provided first support to the hypothesis that comprehension can be on people's mind in different ways, differentially affecting stereotyping behavior. In this study, the effects of attaining comprehension on comprehension-driven stereotyping are examined. As we mentioned in the introduction, stereotyping can function as a means to fulfill a comprehension goal. However, a comprehension goal can also be fulfilled by other means than stereotyping. Therefore, we hypothesize that comprehension goal-based stereotyping will decrease when this goal is attained, independent of whether attainment is stereotype-related or not. Attaining comprehension should lead to deactivation of the goal "to comprehend" and should thus diminish comprehension goal-based stereotyping. On the other hand, we expect stereotyping driven by a comprehension *mode* to remain unaffected by procedures that involve attaining comprehension: mode effects are unlikely to be affected by goal attainment (Higgins, 1996; Förster et al., 2005).

### Method

*Participants and design*

Participants were 104 students who were randomly assigned to one of the nine conditions of a 3 (priming: neutral vs. comprehension goal vs. comprehension mode) x 3 (comprehension fulfillment: no fulfillment vs. unrelated fulfillment vs. related fulfillment) between-participants design.

*Materials and procedure*

All participants were given a booklet consisting of three tasks. The first task, the priming procedure, was identical to the sentence construction task used in Study 1 and 2. The second task concerned the comprehension attainment procedure. There were three versions of this procedure: no task was given, so no comprehension could be attained (representing the "no fulfillment condition"), comprehension could be attained in a stereotyping unrelated manner (through the exposure to riddles and their solutions; after this referred to as the "unrelated fulfillment condition") and comprehension could be attained through stereotyping (after this referred to as the "related fulfillment condition").

In the unrelated fulfillment condition, participants were offered two riddles. Under the guise of a database for riddles, they were asked to first examine the riddles, think about them, and subsequently turn over the page were the solutions were presented and finally, rate the riddles on a likeability-scale. The riddles were selected so that they were hard to solve, but that the solution would evoke an "aha-erlebnis" ("Ooh, I get it", comparable to Archimedes' "Eureka" experience) upon viewing the solutions, resulting in the attainment of comprehension.

In the related fulfillment condition, a person evaluation task was presented to the participants, similar to the person evaluation task used in Study 4.2. The difference was that this paragraph was about a woman (Petra) who performed several ambiguous behaviors that were related to dependency (female stereotypical trait). The underlying thought was that participants could attain comprehension and therefore fulfill their comprehension goal by stereotyping Petra during her evaluation.

The third task; the stereotyping measurement (combined stereotyping variable; Cronbach's $\alpha = .79$) and the debriefing questionnaire were identical to those used in Study 4.1 and 4.2.

**Results and discussion**

As a manipulation check, and replicating the results of Study 4.1, scoring patterns from the person evaluation task (used in the related fulfillment conditions) indicated that comprehension priming increases stereotyping: contrast analyses showed that in comparison to participants in the neutral priming condition ($M = 5.11$, $SD = .93$), the female target

("Petra") was evaluated more stereotypical by participants in the comprehension concept condition ($M$ = 6.25, $SD$ = 1.49), $F(1, 30) = 5.66$, $p < .05$ and comprehension goal condition ($M$ = 6.25, $SD$ = .62), $F(1, 30) = 5.66$, $p < .05$.

With regard to the stereotyping measure, a 3 (Priming) x 3 (Fulfillment) ANOVA revealed no effects on the stereotype-unrelated traits (all $ps > .14$). An ANOVA on the combined stereotyping variable revealed a main effect of priming, $F(2, 95) = 30.60$, $p < .001$, $\eta^2 = .32$, a main effect of fulfillment $F(2, 95) = 7.15$, $p < .01$, $\eta^2 = .08$, qualified by an interaction-effect, $F(4, 95) = 5.50$, $p < .001$, $\eta^2 = .11$.

As predicted, this interaction indicated that comprehension fulfillment did not affect participants in the neutral priming condition: without fulfillment, participants' stereotyping-score was just as low ($M$ = 5.48, $SD$ = .74) in comparison with participants in the related-fulfillment condition ($M$ = 5.33, $SD$ = .80) and participants in the unrelated-fulfillment condition ($M$ = 5.48, $SD$ = .74), all $F$s < 1 (see Table 4.2).

Participants in a comprehension mode also had similar stereotyping levels without comprehension fulfillment ($M$ = 6.77, $SD$ = .52) in comparison with the stereotyping levels of participants in a comprehension mode who received related fulfillment ($M$ = 6.75, $SD$ = .87) and unrelated-fulfillment ($M$ = 6.61, $SD$ = .57), all $Fs < 1$.

However, when participants were primed with a comprehension goal, without comprehension fulfillment, they stereotyped *more* ($M$ = 6.81, $SD$ = .41) in comparison with the scores of participants in the comprehension goal condition who received related fulfillment ($M$ = 5.44, $SD$ = .61), $F(1, 95) = 25.14$, $p < .001$, $\eta^2 = .13$ and unrelated fulfillment ($M$ = 5.31, $SD$ = .59), $F(1, 95) = 29.94$, $p < .001$, $\eta^2 = .15$.

Table 4.2 - Stereotyping as a function of priming condition and comprehension attainment

| | *Priming* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Neutral* | | | *Comprehension goal* | | | *Comprehension mode* | | |
| *Fulfillment* | *No* | *Related* | *Unrelated* | *No* | *Related* | *Unrelated* | *No* | *Related* | *Unrelated* |
| Stereotyping | 5.48 $_a$ | 5.33 $_a$ | 5.48 $_a$ | 6.81 $_b$ | 5.44 $_a$ | 5.31 $_a$ | 6.77 $_b$ | 6.75 $_b$ | 6.61 $_b$ |
| | (0.74) | (0.80) | (0.74) | (0.41) | (0.61) | (0.59) | (0.52) | (0.87) | (0.57) |

Note: means in the same row that do not share the same subscript differ significantly ($p < .05$).

These results show that the attainment of comprehension, whether through an impression formation task or in a stereotyping-unrelated manner, results in the cessation of

comprehension goal-driven stereotyping. However, when stereotyping is driven by a comprehension-mode rather than by a comprehension-goal, it is immune to procedures offering the opportunity to attain comprehension. Interestingly, on the basis of the results of Study 4.2, one could have expected comprehension mode effects to decline after the fulfillment procedures, because these procedures represent a delay between the priming and person perception task. The results however, do not show such a decline. A possible explanation is that the fulfillment procedures reinstated or reactivated the comprehension mode prime, because these procedure were closely related to the concept of comprehension. In other words, because the fulfillment procedures were related to comprehension, they could have brought the previously primed comprehension mode back to mind.

## Study 4.4: Accuracy versus comprehension

The previous studies show that priming of comprehension results in a more stereotypical interpretation of ambiguous behaviors. On the surface, the construct of comprehension appears to be closely related to the construct of accuracy. For example, when one tries to "comprehend" something the goal is probably to do so in an accurate way. However, we would like to define comprehension and accuracy are distinctive needs. After all, the need to "understand", "construct meaning" or "interpret" could be fulfilled by clearly inaccurate impressions and interpretations. Comprehension does not have to be accurate. In fact, research shows that accuracy goals may lead to more careful and critical consideration of accessible knowledge and in fact weaken priming or accessibility (see Ford & Kruglanski, 1995; Kruglanski, 1990; Stapel, Koomen, & Zeelenberg, 1998; Thompson, Moskowitz, & Chaiken, 1994; Weary et al. 2001), whereas comprehension goals typically amplify priming effects (see Petty & Jarvis, 1996; Stapel & Koomen, 1998, 2001). Hence, it appears that an important distinction between accuracy and comprehension concerns is that accuracy is more related to being veridical and make valid, stimulus-based (say what you see, nothing more, nothing less), whereas comprehension is more about constructing meaning (say what you see and make sense of what you see). In the current study, we test this hypothesis by measuring the impact of both comprehension and accuracy goals on stereotyping in one design.

A different issue addressed in this study is that the findings reported in Studies 2 and 3 could perhaps also be explained without invoking stereotypes. Perhaps a comprehension goal simply evokes a general response bias or drive towards disambiguation. Therefore, in the current study we primed different goals and then had people interpret and

evaluate the behavior of a vaguely aggressive person. Crucially, in one of the conditions, a comprehension goal is primed and the target in the person perception task is female (rather than male). If (as we argue) comprehension effects are especially likely to affect stereotyped judgments (because comprehension goals and stereotyping are strongly linked) and not simply all potential judgments, then the impact of comprehension goals should be especially visible when applicable stereotypes may be used in the interpretation of vague behavior. Hence, we predict that comprehension goals will not affect the interpretation of a vaguely aggressive female target because "aggressive" is a male stereotype that does not applies to women (Stapel & Koomen, 1998, 2001).

**Method**

*Participants and Design*

Participants were 66 students who were randomly assigned to one of the four conditions (control, comprehension goal, comprehension goal with non-stereotypical target, accuracy goal).

*Materials and Procedure*

All participants were given a booklet consisting of two tasks. The first task, the priming procedure, was similar to the sentence construction task used in Study 4.1, 4.2 and 4.3; in the accuracy goal condition, six of the twelve scrambled sentences contained words related to accuracy (e.g., precise, accurate, correct). The second task, the person perception task was similar to the one used in Study 4.2 and used the story about Peter whose behavior was vaguely referred to male stereotypes (e.g., aggressiveness, self-assuredness). The only difference being the non-stereotypical target condition, in which the target person's name was changed in "Petra", thus representing a female. The third and last task was a funnelled debriefing questionnaire, based on the methodology to check for awareness as described by Bargh & Chartrand (2000). Participants were asked increasingly specific questions about the study. They were asked what they thought the purpose of the study had been, whether they thought the tasks they had performed had been related, whether they thought their performance on one task may have affected their performance on the next task, and if yes, in what way. Two participants indicated that they thought the sentence construction task may have influenced their judgments on the person perception task. Although they did not specify their suspicion, we excluded these participants from the analyses.

**Results and discussion**

An ANOVA revealed a main effect of condition on the combined stereotyping variable (Cronbach's $\alpha$ = .80), $F(3, 60) = 10.72$, $p < .001$, $\eta^2 = .35$. Replicating Studies 2 and 3, participants in the comprehension goal condition scored higher ($M$ = 6.54, $SD$ = .68) compared to participants in the control condition ($M$ = 5.33, $SD$ = .83), $F(1, 60) = 22.66$, $p < .001$, $\eta^2 = .27$. No differences in scores were found between participants in the control condition ($M$ = 5.33, $SD$ = .83), those in the accuracy condition ($M$ = 5.57, $SD$ = .64) and those in the non-stereotypical target condition ($M$ = 5.37, $SD$ = .80); all $F$s < 1. Furthermore, no effects were found on non-stereotypical traits (all $F$s < 1).

Thus, this study shows that comprehension, but not accuracy, results in more stereotypical interpretation of ambiguous information. Furthermore, it showed that when it is difficult to resolve the vagueness of social information with the application of stereotypes (when a woman engages in vaguely aggressive behavior), comprehension priming does not seem to affect subsequent evaluations of this information. This implicates that comprehension priming indeed influences person perception via an increased use of applicable stereotypical knowledge.

## Study 4.5: Subliminal priming

Although awareness checks in Study 4 indicated that participants were unaware of the link between the manipulations used and the person perception task, they could have been aware of the comprehension goal itself in the relevant condition. Therefore, in the current study we further tested the robustness of our hypotheses by using a subliminal priming technique, thus ensuring nonconscious activation of comprehension goals versus comprehension modes. Conceptualizing goals as desirable end states suggests the operation of two informational features (Aarts, Custers, & Holland, 2007): a cognitive and an affective motivational one. The cognitive feature provides the knowledge of the state that is desired and the affective motivational one that it is desired. In our priming procedure we exposed participants only to the informational feature (comprehension related words) in order to manipulate a comprehension mode and to a combination of both features (desire + comprehension) to manipulate a comprehension goal.

**Method**

*Participants and design*

Participants were 110 students who were randomly assigned to one of the nine conditions of a 3 (Priming: neutral vs. comprehension goal vs. comprehension mode) x 3 (Interspace: none vs. delay vs. fulfillment) between-participants design.

*Procedure*

On arrival, participants were shown into one of twelve cubicles in the experimental room and seated in front of a computer. They were told that they would participate in a set of unrelated studies. First, they performed a parafoveal vigilance priming task. After having completed the vigilance task, participants were instructed to fill in the booklet that was on their desk. Next, participants received a funnel debriefing procedure, in which they were probed for awareness of the priming stimuli, awareness of the influence of the priming task on later judgments, and general suspicion concerning the goal of the study. Finally, they were thanked and debriefed.

*Priming task*. The priming task followed the procedures in Stapel and Blanton (2004). Once participants were seated in front of their computer, the experimenter explained the vigilance task, first verbally and then with instructions on the computer screen. Participants were seated so that the distance between their eyes and the computer screen was 100 cm when they sat erect on the chair, as they were instructed to do. This ensured that the priming stimuli (and masks) were presented outside of participants' perceptual field. The experimenter instructed participants to place their index fingers on the two labelled keys of the keyboard and to press the left key, labelled "L," if a flash appeared on the left side of the screen and the right key, labelled "R," if a flash appeared on the right side of the screen. A fixation point appearing as an "X" was presented continually in the centre of the screen. The experimenter emphasized that because of the unpredictable timing and location of the flashes, the best way to detect all of them quickly would be to keep their eyes on the fixation point at all times. Participants were given 10 (neutral priming) practice trials to become familiar with the procedure and to ensure that they understood it. After answering any questions, the experimenter began the 60 experimental trials of the vigilance task, which took participants approximately 10 minutes. Each priming stimulus (words) was presented for 100 ms, immediately followed by a 110-ms mask (black-grey dotted squares). The words that were

randomly flashed in the 10 practice trials and in 40 of the experimental trials were either neutral words (control condition) or comprehension-related words (in both the comprehension mode and comprehension goal condition). In the remaining 20 experimental trials, either neutral words (control and comprehension mode condition) or motivational words (in the comprehension goal condition; e.g., "want," "need," "like") were randomly flashed.

*Interspace.* After the priming procedure, all participants were given a booklet consisting of different tasks. For participants in the "Interspace: none" condition the booklet consisted of only the person perception task (see Study 4.2). In the delay condition this task was preceded by a delay task (see Study 4.2) and in the fulfillment condition, this task was preceded by the stereotype-related fulfillment task (see Study 4.3).

*Awareness and suspicion.* Finally, each participant underwent a funnelled debriefing procedure. Thus, they were probed for awareness of the priming stimuli, awareness of the influence of the priming task on later judgments, and general suspicion concerning the goal of the study. Similar to what was found in earlier studies using this specific paradigm (see Stapel, Koomen & Ruys, 2002; Stapel & Blanton, 2004), none of the participants showed awareness of the priming stimuli. Four participants indicated suspicions concerning a possible link between the tasks and were excluded form analyses.

**Results and discussion**

A 3 (Priming) x 3 (Interspace) ANOVA on the combined stereotyping variable (Cronbach's $\alpha = .86$) revealed a main effect of priming, $F(2, 97) = 18.76$, $p < .001$, $\eta^2 = .39$ that was qualified by the predicted interaction effect, $F(4, 97) = 18.50$, $p < .001$, $\eta^2 = .35$ (for means and comparative tests, see Table 4.3).

To interpret this interaction effect, we first focused on the no-interspace condition Simple comparisons indicated that neutrally primed participants stereotyped less ($M = 5.41$, $SD = .83$) compared to participants primed with a comprehension goal ($M = 6.52$, $SD = .54$), $F(1, 97) = 21.59$, $p < .001$, $\eta^2 = .22$ and participants primed with a comprehension mode ($M = 6.67$, $SD = .64$), $F(1, 97) = 18.53$, $p < .001$, $\eta^2 = .19$. Thus, the basic comprehension effects on stereotyping were replicated with subliminal priming procedures.

Second, we turned our attention to the delay condition. Here previous results were also replicated. After a delay, participants primed with a comprehension goal stereotyped more ($M = 7.27$, $SD = .63$) compared to participants who received neutral priming ($M =$

5.33, *SD* = .86), $F(1, 97) = 45.99$, $p < .001$, $\eta^2 = .47$ and compared to participants who received comprehension mode priming ($M = 5.29$, $SD = .93$), $F(1, 97) = 47.99$, $p < .001$, $\eta^2 = .49$.

With respect to the fulfillment condition, our previous results were again replicated. After obtaining comprehension, participants primed with a comprehension mode ($M = 6.80$, $SD = .56$) stereotyped more compared to neutrally primed participants ($M = 5.61$, $SD = .38$), $F(1, 97) = 15.69$, $p < .001$, $\eta^2 = .16$ and compared participants primed with a comprehension goal ($M = 5.44$, $SD = .74$), $F(1, 97) = 22.28$, $p < .001$, $\eta^2 = .23$.

Table 4.3 - Stereotyping as a function of subliminal priming condition and period between priming and person evaluation

| | *Priming* | | |
|---|---|---|---|
| | *Neutral* | *Comprehension Goal* | *Comprehension Mode* |
| *Interspace* | | | |
| *None* | 5.40 $_a$ | 6.52 $_b$ | 6.67 $_b$ |
| | ( .83) | (.54) | (.64) |
| *Delay* | 5.33 $_a$ | 7.27 $_c$ | 5.29 $_a$ |
| | (.86) | (.63) | (.93) |
| *Fulfillment* | 5.61 $_a$ | 5.44 $_a$ | 6.80 $_b$ |
| | (.38) | (.73) | (.56) |

Note: means in the same row that do not share the same subscript differ significantly ($p < .05$).

All in all, this study replicated previous findings. It shows that the subliminal priming of a comprehension goal and mode results in more stereotypical interpretation of ambiguous behavior. Furthermore, it shows that comprehension can be primed nonconsciously in different ways, leading to different stereotyping dynamics. When a comprehension mode is primed, the effects decay over time and are not influenced by receiving comprehension. When a comprehension goal is primed however, the effects do not decay after a short period of time, but cease when the goal is fulfilled.

# General Discussion

**Summary of findings**

The five studies presented here provide important evidence concerning the origins of stereotyping behavior. The studies convincingly show that there is a clear link between comprehension and stereotyping: people stereotype more when comprehension is on top of their minds. The present studies also show that comprehension can be on people's mind in at least two different ways: as a (motivational) goal and as a (nonmotivational) mode of thinking. Importantly, although both mental states may result in increased stereotyping effects, the dynamics underlying such stereotyping effects are rather different.

In Study 4.1, we successfully introduced a priming procedure that allowed us to activate a comprehension goal versus a comprehension mode. In Study 4.2, we showed that both a comprehension goal and a comprehension mode result in increased stereotyping effects. Over time however, the effects of a comprehension mode strongly decay, whereas stereotyping effects via a comprehension goal increase after a delay. Study 4.3 offered more insight into the impact of comprehension attainment when comprehension is on people's mind. In that study we showed that attaining comprehension, either through stereotyping or in a stereotyping unrelated way, resulted in the cessation of comprehension goal-driven stereotyping effects, whereas comprehension mode-driven effects remained unaffected by the comprehension attaining tasks. Study 4.4 showed that – contrary to comprehension goals - , accuracy goals do not result in increased stereotyping. Study 4.5 replicated some of the main effects of Studies 1-3 by using a subliminal priming technique, thus eliminating the possibility that the differential effects of goal versus mode priming may be caused by differential awareness of goals versus modes.

In sum then, the present studies provide strong support for our contention that when comprehension is (non)consciously on people's mind, they stereotype more. Moreover, these findings show that comprehension can be on one's mind as a goal and as a processing mode, resulting in different stereotyping dynamics.

**Links with stereotyping and priming literature**

With regard to the existing stereotyping literature, these findings provide more insight into the "*why question"* behind stereotyping. In everyday life, comprehension can be on one's mind in a lot of social situations, for example when one encounters a member of an unfamiliar social group or during a job interview. Ironically, these are the kind of situations where the harmful consequences of stereotyping are particularly likely to be felt. The present studies emphasize that "how" comprehension is on one's mind will strongly influence stereotyping behavior. On the dark side, our results suggest that situations completely unrelated to stereotyping – for example, watching a game show on television- can induce a comprehension mode in people, resulting in increased stereotyping. On the bright side, our findings suggest that comprehension-fostering situations – even when they are totally unrelated to stereotyping, can put comprehension goal-driven stereotyping to a halt.

Over the years, priming research has shown that a single prime can have all kinds of effects on all kinds of measures. Priming can affect people's memories, moods, emotions, goals, plans, attitudes, and behaviors (Bargh, 2006). To our knowledge however, we are the first to show that in some cases primes that refer to the same construct ("comprehension") can have different effects, depending on how this construct is mentally represented (as a "goal" or as a "processing mode"). Most contemporary research into nonconscious goal pursuit assume that goal pursuit can be primed by exposure to concepts related to the goal. In line with other research that explores the affective-motivational context surrounding goal priming (Aarts, Custers, & Holland, 2007; Custers & Aarts, 2005), we further concretize this idea by showing that exposure to the construct of comprehension only primes a comprehension goal when comprehension is represented as a desired state. If not, a comprehension mode is primed. Importantly, similar to a comprehension goal, such a comprehension mode also results in behavior (i.e. stereotyping) associated with this goal, but follows nonmotivational priming dynamics. Thus, our research suggests that –especially when trying to fight the negative effects of stereotyping - it is important to know *what determines whether* the effects of accessible (primed) information are based on motivational or nonmotivational mental representations and stresses that an important route for future research may be to investigate for what type of primes and in what type of situations mode versus goal priming yields similar versus different effects.

**Stereotyping, situation, and personality**

The present research also bears interesting parallels with more personality-oriented stereotyping research. Previous research has shown that people with chronic needs related to comprehension (need for structure, need for closure, need for cognition) are more likely to use stereotypes than people who do not have such needs (see for example, Neuberg & Newson, 1993). Future research may want to investigate the relations between these chronic "comprehension effects" and the more contextual effects found in the current experiments. For instance, the current studies coin the question how a *chronic need* should actually be defined and is mentally represented. One could argue that because a need is generally defined as a desired end-state, a chronic need sounds like an oxymoron. Perhaps then, the effects of chronic needs as studied in the individual differences literature are better to be likened to the present "processing mode" effects than to the present "goal" effects. Thus, the framework used in the present studies could be employed to see whether people with a chronic need for structure have a comprehension goal that is constantly activated because of a malfunctioning goal fulfillment mechanism or because these people have a comprehension goal that easily reactivates after fulfillment of the goal.

**Coda**

In the movie "Finding Forrester", Jamal – a very talented young writer – is accused of plagiarism by his professor. When his tutor hears about this, he proclaims: "When we don't understand, we turn to our assumptions". Because Jamal is an African-American, this illustrates how a comprehension goal can result in the use of stereotypes when interpreting certain behaviors: the professor tried to understand how a poor black kid from the Bronx was able to write such beautiful prose and subsequently concluded – stereotypically - that Jamal must have cheated. The present set of studies correspondingly show that there exists a strong nonconscious link between the construct of comprehension and stereotyping behavior. Furthermore, it accentuates the importance of differentiating the motivational effects of a comprehension goal activation from the nonmotivational effects of comprehension mode activation. Whether comprehension is a goal that needs to be achieved or a processing mode that induces a specific way of seeing makes all the difference.